

REMARKS

Claims 1-88 are pending in the present application. Claims 76, 81, 82 and 87 have been amended. Claim 80 has been cancelled. No new matter has been added. Accordingly, entry of the present Amendment is requested.

Claims 80-82 and 87 have been rejected under 35 U.S.C. § 112, second paragraph, as assertedly being indefinite.

Claim 80 has been cancelled and Claims 81, 82 and 87 have been amended in a manner to overcome the rejection. Accordingly, withdrawal of this rejection is requested.

Claims 76 and 79 have again been rejected under 35 U.S.C. § 102 as being anticipated by Beer. Additionally, Claims 76, 79 and 83-85 have again been rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer.

As noted above, however, Claim 80 has been cancelled. The feature of the invention previously recited therein has been incorporated into Claim 76. Thus, Claim 76 now recites “wherein the titanium oxide carrier contains an OH group bound to Ti in an amount of 0.1×10^{-4} to 30×10^{-4} mol per one gram of the titanium oxide carrier.” (Support for the phrase “bound to Ti” is located in the specification at, for example, page 46, lines 12-13.) Claim 80 was not rejected based upon Beer. Accordingly, withdrawal of these rejections is requested.

Claims 76, 79-85 and 87 have again been rejected under 35 U.S.C. § 103(a) as being unpatentable over Gratzel.

Applicants again respectfully traverse this rejection. Applicants respectfully submit that, for the reasons contained in the Rule 111 Amendment filed November 30, 2001, the present claimed invention would not have been *prima facie* obvious from Gratzel. In particular, Gratzel

does not teach or suggest a supported ruthenium oxide catalyst including a titanium oxide carrier containing not less than 80% by weight rutile titanium oxide.

Further, the difference between the catalyst of Claim 76 and the catalyst disclosed in Gratzel is apparent from the attached second Declaration Under 37 C.F.R. § 1.132 of Kohei Seki.

Namely, as apparent from the Declaration, ruthenium oxide (RuO_2) supported on titanium oxide (TiO_2 :100% rutile structure), as recited in Claim 76, can not be observed in a transmission electron micro scope (TEM) image of the catalyst as shown in Photo 1.

On the other hand, RuO_2 supported on titanium oxide (TiO_2 : rutile structure 17%, anatase structure 83%) can be observed as many particles (black or dark spots) in a TEM image of the catalyst according to Gratzel, as shown in Photo 3, because the supported ruthenium oxide agglomerates on TiO_2 .

In addition, when TiO_2 carrier has a 100% anatase structure, RuO_2 markedly agglomerates as shown in Photo 2. That is, particles of RuO_2 are observed as relatively large spots (dark spots indicated by arrows).

Therefore, the catalyst of the instant claimed invention is clearly different and unobvious from the catalyst of Gratzel in structure.

Further, Gratzel fails to teach that the structure of the supported ruthenium oxide depends on the structure of TiO_2 .

In view of the foregoing, Applicants respectfully submit that the present claimed invention as defined by independent Claim 76, would not have been *prima facie* obvious from Gratzel. Accordingly, withdrawal of this rejection is requested.

Claims 76, 79-85 and 87 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Buysch.

Applicants also respectfully traverse this rejection. Applicants respectfully submit that, for the reasons contained in the Rule 111 Amendment filed November 30, 2001, the present claimed invention would not have been *prima facie* obvious from Buysch.

In particular, Buysch discloses that a platinum metal, a platinum metal halide or a complex containing a platinum metal halide is supported on a metal oxide. However, Buysch fails to teach or suggest a platinum metal oxide, particularly ruthenium oxide, supported on TiO₂. The structure of ruthenium oxide supported on TiO₂ varies depending on the structure of the TiO₂ carrier. Buysch fails to teach, suggest or appreciate that the structure of ruthenium oxide depends on the structure of TiO₂.

In addition, the Examiner argues that “Buysch ‘768 further discloses that it is possible to fix one or more platinum metals ... Calcination is carried out at from 100-800°C and the calcination time is generally a few hours, such as 1 to 3 hours (note column 6, lines 29-45).” However, as apparent from column 5 of Buysch, lines 16-55, the base is used for precipitating the platinum metal compound (the platinum metal halides), but is not used for binding an OH group to TiO₂.

In addition, as discussed above, Applicants have amended Claim 76 to further distinguish the present claimed invention from the cited prior art. Buysch does not teach or suggest a supported ruthenium oxide catalyst “wherein the titanium oxide carrier contains an OH group

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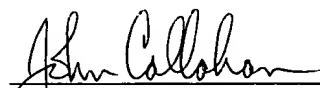
bound to Ti in an amount of 0.1×10^{-4} to 30×10^{-4} mole per one gram of the titanium oxide carrier," as presently claimed.

In view of the foregoing, Applicants respectfully submit that the present claimed invention as defined by amended Claim 76, would not have been *prima facie* obvious from Buysch. Accordingly, withdrawal of this rejection is requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 80 is cancelled without prejudice or disclaimer.

The claims are amended as follows:

76. (Twice Amended) A supported ruthenium oxide catalyst obtained by supporting on a titanium oxide carrier containing not less than 80 % by weight of rutile titanium oxide, wherein the titanium oxide carrier contains an OH group bound to Ti in an amount of 0.1×10^{-4} to 30×10^{-4} mol per one gram of the titanium oxide carrier.

81. (Twice Amended) The catalyst according to claim 76, wherein the titanium oxide carrier [containing] contains an OH group bound to Ti in an amount of 0.2×10^{-4} to 20×10^{-4} [(mol/g-carrier) is used as the carrier] mol per gram of the titanium oxide carrier.

82. (Twice Amended) The catalyst according to claim 76, wherein the titanium oxide carrier [containing] contains an OH group bound to Ti in an amount of 3×10^{-4} to 10×10^{-4} [(mol/g-carrier) is used as the carrier] mol per one gram of the titanium oxide carrier.

87. (Amended) The catalyst according to claim 79, wherein the titanium oxide carrier [containing] contains an OH group bound to Ti in an amount of 3×10^{-4} to 10×10^{-4} [(mol/g-

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carrier) per unit weight of a carrier used as the carrier] mole per one gram of the titanium oxide
carrier.